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PEARL CULTURE

Prepared in the Division of Fishery Biology

To the Chinese belongs the credit of discovering the method of assisting nature in producing pearls. Historical records show that this art was practiced in the northern part of the province Chekiang near the City of Titsin as far back as the Fourteenth Century. It consisted in introducing various foreign bodies into the shells of fresh water mussels between the inner surface of the valve and the mantle. After a lapse of several months the mussels were opened and the inserted objects now covered with a deposition of pearly substance were withdrawn. Various forms of matrices or nuclei were used, but those principally selected were small beads of nacre, pellets of mud, and thin leaden images of Buddha.

The first person in Europe who suggested the possibility of pearl culture was the famous Swedish naturalist, Linnaeus. Unfortunately, the method to which he refers in his letter dated February 6, 1761, was never published authoritatively. It is known, however, that the essential points of the process were to make a very small hole in the shell of a mollusk and insert a round pellet of limestone fixed at the end of a fine silver wire.

Cultured pearls were also produced by similar methods in Finland, in Tahiti, and at Espiritu Santo Island inthe Gulf of California. The French scientist, Louis Boutan, experimented in 1897 with the abalone. Through small holes bored into the shell he inserted pellets of mother-of-pearl into the mantle and gill cavity of the mollusk. In six months the objects became coated with a sufficiently thick layer of nacre. Similar experiments with pearl bearing marine and fresh water mollusks were carried out in Australia and in this country. Some of the attempts made in 1896-98 at Cedar Rapids, Iowa, were quite successful.

It was, however, through the efforts of Mikimoto in Japan that the production of cultured pearls developed into a prominent industry. Adopting the old Chinese method, he succeeded in producing perfect round pearls from the pearl oyster, Meleagrina margaritifera. The process, covered in this country and abroad by a number of patents, consists of removing from a living pearl oyster a piece of mantle and using it as a bag into which is placed a small fragment of shell of the fresh water mussel. The mouth of the bag is then tied with a thread and the whole thing is inserted into an incision made in the subcutaneous tissues of another pearl oyster. The thread is withdrawn and the wound disinfected. The oyster is then returned to the sea. This process is extremely delicate and requires great skill. Nearly 60 percent of the oysters treated by Mikimoto's method will produce pearls but about 7 years are required to raise a pearl of a size suitable for a fine

necklace. During this period of time an average of 20 per cent of the oysters will die and only 4 or 5 per cent will contain pearls good enough to be marketed.

The success of Mikimoto's enterprise was due to the fact that besides a very fine technique, he also developed a practical method of cultivation of the pearl oyster. All his oysters are raised on pearl oyster farms comprising 40,830 acres of sea bottom. The method of farming consists in obtaining a set of oyster larvae on special collectors coated with lime and placed in wire baskets. The collectors are lowered to a depth where the free swimming larvae are most abundant. Several months later the collectors are removed and the young oysters attached to them are placed in wire cages suspended from rafts. At regular intervals the cages are taken up to clean the shells and to remove debris and dead organisms. The extent of Mikimoto's enterprise can be judged by the fact that before the war it employed over 1,000 persons and planted about three million pearl oysters annually.

Culture pearls can be produced in all pearl-bearing mollusks, as for instance, Australian and American pearl oysters, the abalone, Pinna (Sea Wings or Pen Shells), and certain fresh water mussels. No pearls can be raised, however, in the edible oysters, clams, scallops, sea mussels, and other mollusks the shells of which have no lustrous nacre. Limy formations occasionally found in these mollusks attached to their shells or inside the tissues have no value. In producing culture pearls the mollusks should be kept for a long time in their natural environment well supplied with clean water and food.

The Fish and Wildlife Service is not engaged in any investigations regarding the culture of pearls and does not recommend any methods developed by various persons, nor does it supply mussels and other mollusks for this purpose.

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